## Amendments to the Claims

## 1 - 62 (cancelled)

- 63. (new) A method of testing or screening a mammal thought to have or to be predisposed to have a neural system disorder comprising detecting the presence of mutation in the NBEA gene or its associated promotor in a sample of said mammal.
- 64. (new) The method of claim 63, said method comprising: detecting a modification of the NBEA gene or its promotor in the chromosomal material of said sample, wherein said modification is selected from a) substitution, b) deletion, c) frame-shift, d) insertion or e) altered epigenetic control; whereby said modification causes a loss of biological function in the NBEA gene product;
- 65. (new) The method of claim 64, which further comprises, correlating the mutation of said gene with a potential for a neural system disorder.
- 66. (new) The method of claim 63, wherein said mutation in the NBEA gene or its promotor is detected by hybridisation with a labelled probe.
- 67. (new) The method of claim 63, wherein detection of the presence of the mutation in the NBEA gene is achieved by detecting altered levels of the mRNA transcripts or mRNA precursor.

- 68. (new) The method of claim 63, wherein said mutation is detected by (a) amplification of the chromosomal material using PCR; (b) sequencing said material to detect the modification of the nucleotide sequence; and (c) correlating the modification of said gene with a potential for neural system disorders.
- 69. (new) The method of claim 63, wherein, said method comprises: (a) detecting the absence, inappropriate, or modified expression of NBEA gene product using labelled ligands to said gene product in said sample; and (b) correlating said absence, inappropriate, or modified expression with a potential for neural system disorders.
- 70. (new) The method of claim 69, wherein the said ligands are monoclonal or polyclonal antibodies.
- 71. (new) The method of claim 63, wherein said neural system disorder is autism.
- 72. (new) The method of claim 63, wherein said neural system disorder is selected from the group consisting of a disorder associated with any or several symptoms consisting of the group disturbed cognitive functions, disturbed emotional control, disturbed in motor control, a disorder resulting from a decreased number of Purkinje cells and a disorder resulting from brain anomalies.
- 73. (new) The method of claim 63, wherein said neural system disorder results from a disturbed the glutamate neurotransmitter system.
- 74. (new) The method of claim 63, wherein said neural system disorder results from reduced levels of the anti-apoptotic protein bcl2.

- 75. (new) The method of claim 63, which comprises hybridising a polynucleotide sequence which is hybridisable with a variant NBEA gene, having a deletion, insertion or base substitution which affects transcription and/or translation of the NBEA gene to the NBEA gene in said sample.
- 76. (new) A method of preventing or treating a neural system disorder in a mammal, said method comprising administering to said mammal a polynucleotide comprising the NBEA gene, an allelic variant, minigene or an homologue thereof encoding NBEA or an homologue thereof
- 77. (new) The method of claim 76, wherein the neural system disorder is autism.
- 78. (new) A method of preventing or treating a neural system disorder in a mammal, said method comprising administering to said mammal a polypeptide comprising NBEA or a fragment thereof.
- 79. (new) The method of claim 78, wherein a neural system disorder is autism.
- 80. (new) An isolated polynucleotide comprising a nucleotide sequence, wherein said sequence includes at least one mutation of the NBEA gene, wherein said mutation is selected from a) substitution, b) deletion, c) frame-shift, d) insertion, or e) site-directed mutagenesis that causes a loss of biological function in the NBEA gene.
- 81. (new) An isolated cell containing the polynucleotide of claim 80.
- 82. (new) The cell of claim 81, wherein said cell is a neural cell.

- 83. (new) The neural cell of claim 82, wherein the cell is derived from an immortal cell line, such as embryonic stem cells, neuronal cell line, or tumour derived cell line.
- 84. (new) The neural cell of claim 82, wherein the NBEA gene is under control of a neural-specific promoter or inducible promoters.
- 85. (new) A non-human animal containing in its genome the polynucleotide of claim 80.
- 86. (new) A vector containing the polynucleotide of claim 80.
- 87. (new) An engineered cell comprising a vector comprising the vector of claim 86.
- 88. (new) An engineered cell comprising a vector encoding RNAi specific for NBEA mRNA encoded by a heterologues gene relative to the genome of said cell.
- 89. (new) A method of screening for therapeutic agents suitable to treat autism comprising: (A) providing the engineered cell of claim 87 or 88 or providing a cell containing an isolated polynucleotide comprising a nucleotide sequence, wherein said sequence includes at least one mutation of the NBEA gene, wherein said mutation is selected from a) substitution, b) deletion, c) frame-shift, d) insertion, or e) site-directed mutagenesis that causes a loss of biological function in the NBEA gene; (B) introducing to the cell a agent to be screened; and (C) correlating change in said cell with the activity of the agent.
- 90. (new) The method of claim 89, wherein said changes in said cell are survival, proliferation, differentiation or outgrowth.

- 91. (new) The method of claim 89, wherein said changes in said cell are changes the type II protein kinase A phosphorylation pathway.
- 92. (new) A non-human animal with locoregional neural transgenes, wherein said animal comprises a vector encoding RNAi specific for NBEA mRNA encoded by a heterologues gene relative to the genome of said cell
- 93. (new) A method of screening for therapeutic agents comprising: (A) providing the non-human animal of claim 85 or the non-human animal of claim 92 (B) introducing to the animal a agent to be screened; and (C) correlating a change in the development of autism.
- 94. (new) A method of screening for a therapeutic agents suitable to treat autism comprising: (A) providing an engineered yeast cell, comprising an introduced nucleotide sequence comprising NBEA gene or an allelic variant, minigene, a synthetic gene or a homologue thereof; (B) introducing to the cell a compound, chemical signal or agent to be screened; and (C) correlating change in said cell with the activity of the compound, chemical signal or agent.
- 95. (new) The method of claim 94, which method comprises screening for compounds, chemical signals or agents that directly or indirectly affect the biochemistry of NBEA.